

CLAIMS

1. Transmission shift system comprising a synchronizing device for idler wheels, which can be actuated hydraulically and comprises at least one piston (1) that can mesh with a selected idler wheel (3) as the sliding sleeve, characterized in that the piston can be displaced axially on a shaft (9) by means of hydraulic actuation and is non-rotatably connected with it, wherein self-locking synchronization is provided.

2. Transmission shift system pursuant to claim 1, characterized in that the synchronizing device comprises a piston carrier (5) accommodating the piston (1), said carrier being non-rotatably connected to the shaft (9) and comprising a pressure oil feed line (10) so that a piston chamber between the piston (1) and the piston carrier (5) is provided, which can be supplied with pressure for hydraulically actuating the piston (1).

3. Transmission shift system pursuant to claim 1 or 2, characterized in that the piston (1) is designed as a step-shaped annular flange, which on its outside step comprises first interior teeth (12) for connecting with the idler wheel (3) and on its inside step comprises second interior teeth (13) for connecting with the shaft (9).

4. Transmission shift system pursuant to one of the above claims, characterized in that at least the end of the first interior teeth (12) of the piston (1) that faces the idler wheel (3) is chamfered.

5. Transmission shift system pursuant to one of the above claims, characterized in that the idler wheel (3) comprises running gears (15) for positive connection with additional torque-transmitting elements and coupling teeth (16) for positive connection with the piston (1), and in that the idler wheel (3) is seated rotatably on the shaft (9).

6. Transmission shift system pursuant to one of the above claims, characterized in that at least one friction plate (2, 4) is provided with a friction surface facing the idler wheel (3), wherein each friction plate (2, 4) comprises at

least one set of interior teeth (17, 17'), which is provided for connection with the shaft (9).

7. Transmission shift system pursuant to one of the above claims, characterized in that in the axial direction between the piston (1) and the idler wheel (3) a first friction plate (2) with interior teeth (17) and exterior teeth (18) is provided, which is chamfered at least on the end that faces the piston (1).

8. Transmission shift system pursuant to one of the above claims, characterized in that the first friction plate (2) during a synchronizing phase is provided as a locking element resulting in a self-locking synchronizing device.

9. Transmission shift system pursuant to one of the above claims, characterized in that the teeth of the first interior teeth (12) of the piston (1) can be guided through the respective intermediate spaces between the teeth of the exterior teeth (18) of the first friction plate (2) in the axial direction for shifting purposes so that the piston (1) that is connected to the shaft (9) can be positively connected to the idler wheel (3).

10. Transmission shift system pursuant to one of the above claims, characterized in that a second friction plate (4) is arranged on the side of the idler wheel (3) that faces away from the piston (1).

11. Transmission shift system pursuant to one of the above claims, characterized in that a third friction plate (11) is provided, which forms an outside plate, wherein between the outside plate and the second friction plate (4) a fourth friction plate (19) is arranged, which forms an inside plate.

12. Transmission shift system pursuant to one of the above claims, characterized in that at least one return spring (6) is provided to return the piston (1) to its position.

13. Transmission shift system pursuant to claim 12, characterized in that several return springs (6) are provided, which are evenly distributed across the circumference of the piston (1).

14. Transmission shift system pursuant to one of the above claims, characterized in that at least one sealing element (21, 21') is provided between the piston carrier (5) and the piston (1) to seal the piston chamber.

15. Transmission shift system pursuant to claim 8, characterized in that the interior teeth of the friction plate (2) have play in relation to the shaft (9) that is as large as the intermediate space between two adjoining teeth of the first interior teeth (12).